Installation Instructions
LM4R MVOLT Switching Module

READ AND FOLLOW ALL SAFETY INSTRUCTIONS!
SAVE THESE INSTRUCTIONS AND DELIVER TO OWNER AFTER INSTALLATION

IMPORTANT SAFEGUARDS

When using electrical equipment, basic safety precautions should always be followed including the following:

READ AND FOLLOW ALL SAFETY INSTRUCTIONS.

- Do not use outdoors.
- Use only indoors in dry, relatively clean, non-condensing humidity environments.
- Do not mount near gas or electric heaters.
- Equipment should be mounted in locations and at heights where it will not be subjected to tampering by unauthorized personnel.
- The use of accessory equipment not recommended by the manufacturer may cause an unsafe condition.
- Do not use this equipment for other than its intended use.

SAVE THESE INSTRUCTIONS

To reduce the risk of death, injury or property damage from fire, electric shock, cuts, abrasions, falling parts, and other hazards:

- Service of the equipment must be performed by qualified service personnel.
- Installation and maintenance must be performed by a person familiar with the construction and operation of this product and any hazards involved. All applicable codes and ordinances must be followed.
- Read this document before installing, servicing, or maintaining this equipment. These instructions do not cover all installation, service, and maintenance situations. If your situation is not covered, or if you do not understand these instructions or additional information is required, contact Acuity Controls.

WARNING

Before installing, servicing, or maintaining this equipment, follow these general precautions.

To reduce the risk of electrocution:

- Make sure the equipment is properly grounded.
- Always de-energize any equipment before connecting to, disconnecting from, or servicing the equipment.

To reduce the risk of fire:

- Use supply conductors with a minimum installation temperature rating as specified.

To reduce the risk of personal injury from cuts, abrasions:

- Wear gloves to prevent cuts or abrasions from sharp edges when removing from carton, handling and maintaining this equipment.
- Do not install damaged equipment.

Acuity Controls, a division of *Acuity Brands* Inc., assumes no responsibility for claims arising out of improper or careless installation or handling of this product.

SAVE THESE INSTRUCTIONS

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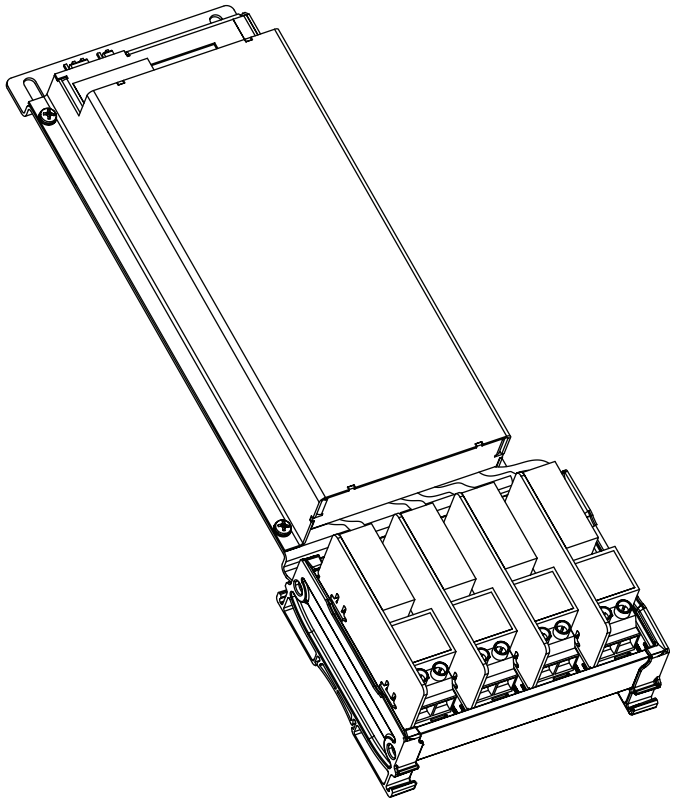
Installation Instructions
LM4R MVOLT Switching Dimming Module

The LM4R switching module can switch (ON/OFF only) loads of any type. The LM4R is intended for use with 120-277V, 50/60Hz circuits. See below for full details.

Important Module Information

1. Ambient Conditions:
   Maximum Ambient Temperature: 104°F/40° C
   Minimum Ambient Temperature: 32°F/0°C
   Relative Humidity:10-90% Non condensing
2. The LM4R MVOLT module is rated for 120-277V, 50/60 Hz operation.
   Maximum ratings:
   Max relay ratings per circuit:
   20 Amps @ 277V Resistive/Magnetic
   16 Amps @ 277V Electronic ballast/driver
   20 Amps @ 250V Tungsten
   20 FLA @ 120V Motor Load
3. Verify that the load type being connected is compatible with the dimmer module type and capacity as listed on the module label.
4. Test all branch circuits for short circuits prior to energizing the module.
5. Use only copper conductors with 90°C insulation rating or higher.
6. Output terminal block specifications:
   (1) #10, #12, or (2) #14 AWG conductors maximum.
7. Each LM module is bonded to the mounting surface using the (2) supplied #8-18 x 5/16" type B serrated mounting screws. Both screws must be used and torqued to a min 24 inch-lbs to insure a good ground. If these screws are lost replace ONLY with screws of this type to insure proper grounding.



LM4R MVOLT Module

LM4R Compatible Load Types

LM4R MVOLT Compatible Load Types
- All 120/277VAC, 50/60Hz non dimmed

Table 1 - LM4R MVOLT Module Output Ratings

LM4R MVOLT
Four 120/277V CIRCUITS
20 Amps @ 277V Resistive/Magnetic 16 Amps @ 277V Electronic ballast/driver 20 Amps @ 250V Tungsten 20 FLA @ 120V Motor Load

NOTE:
The LM4R module will delay switching operations for approximately five seconds after it is initially powered. During normal operation, it will limit the relay open and close operations to an average of one per second. If this average rate is exceeded, the module may delay a requested operation for up to five seconds.

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Before You Start

1. Disconnect power prior to installation or servicing.
2. Install in accordance with the National Electrical Code and any other codes which may apply.
3. Use only as intended.
4. Use only accessories recommended by Acuity Controls.
5. Use only at the voltage listed on the product and component labels.

Relay Connections

The load circuits the relays are controlling can be fed in 1 of 2 ways:

1. From breakers in a separate breaker panel. Using breakers in a separate breaker panel allows for fully loaded circuits to be controlled per relay.
2. From a branch breaker in the LMP panel. A single LMP branch breaker can feed 1, 2, 3, or all 4 relays of an LM4R module. The combined load total must not be more than the rating of the LMP branch breaker (16A or 20A).

See Figures 5, 6 and 7 for typical details.

Relays in LMP ML (Main Lug) panels can be fed by either method.

Relays in LMP FT (Feed Through) panels must be fed by breakers from a separate breaker panel.

Module Installation and Wiring

1. MOUNT THE MODULE(S)
   Mount the LM4R module by inserting the mounting tabs into the slots in the back of the enclosure. Secure it with the (2) mounting screws provided.
   See Figures 1 and 3 for details.
2. MOUNT THE RELAY ASSEMBLY
   Mount the relay assembly by snapping it down onto the DIN rail. See Figures 1 and 3 for details.
3. CONNECT THE RELAY RIBBON CABLES
   Each relay uses a ribbon cable for communication to the module circuit board. Connect each relay ribbon cable to the circuit board.
4. CONNECT THE MODULE DATA NETWORK
   Connect the module data network connector to the 3 position terminal on the side of the LM4R module.
   See Figures 1 and 2 for details..
5. CONNECT THE MODULE POWER
   Connect the module power connector to the 2 position terminal on the side of the LM4R module. See Figures 1 and 2 for details.
6. Repeat steps 1, 2, 3 and 4 for additional modules.
7. CONNECT THE RELAY WIRING
   Connect the relay input lug(s) to either a branch breaker in the LMP panel, or to a breaker(s) in a separate breaker panel. See Figures 5, 6 and 7 for typical details.
8. CONNECT THE LOAD WIRING
   Connect the relay output lug(s) to the load circuit(s) being controlled. See Figures 5, 6 and 7 for typical details.
9. OVERRIDE RELAY(S) TO ON IF DESIRED
   See Figure 1 for details.

Note: Use appropriately sized conductors.
Torque all terminal block screws to 5.3 inch-lbs
Test for short circuits prior to energizing load!

10. MODULE CONFIGURATION
    Modules are fully programmable using a Fresco Touchscreen station.

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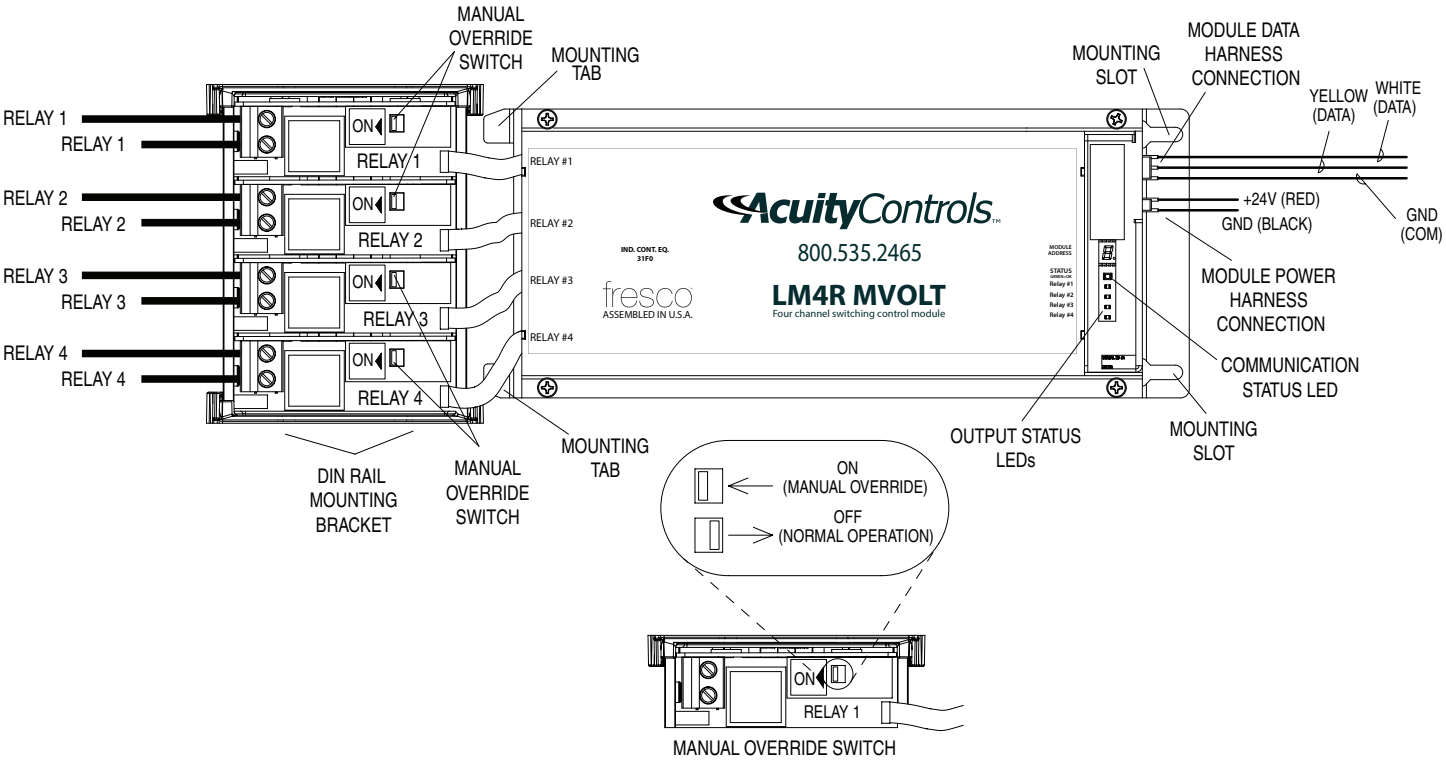

Figure 1 - LM4R MVOLT Details

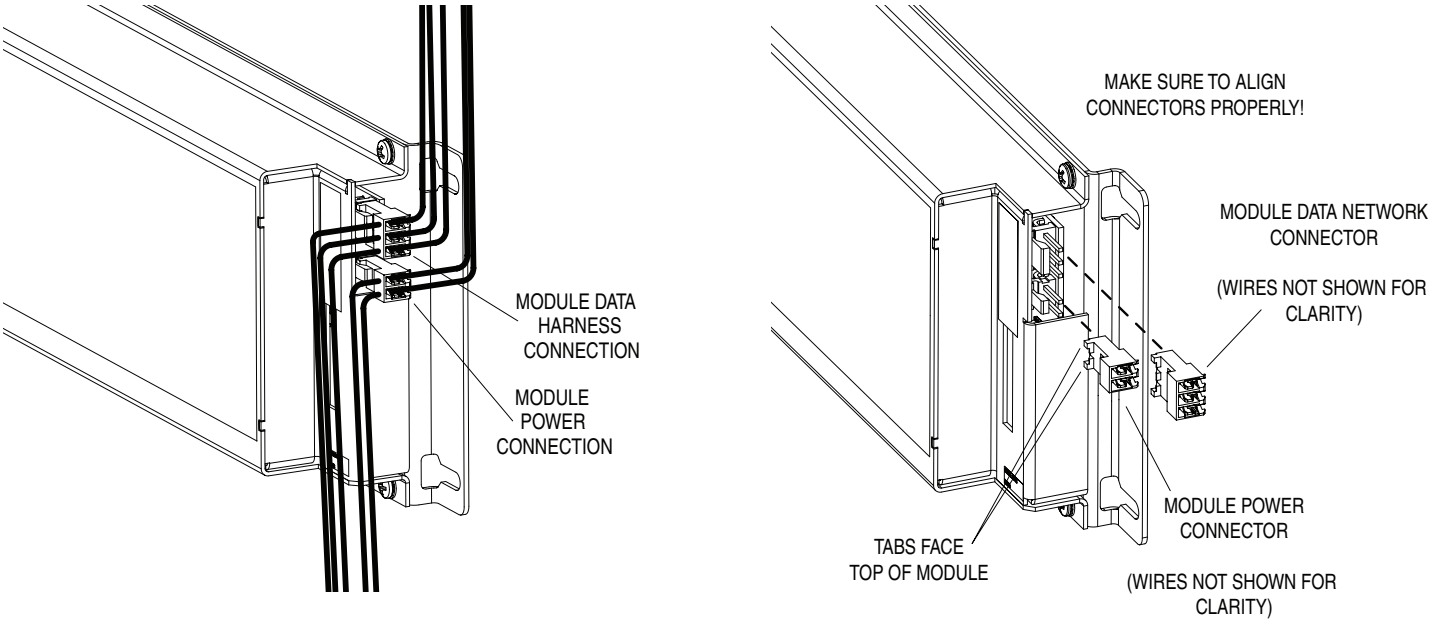
MODULE DATA HARNESS CONNECTION
MODULE POWER CONNECTION
MAKE SURE TO ALIGN CONNECTORS PROPERLY!
MODULE DATA NETWORK CONNECTOR
(WIRES NOT SHOWN FOR CLARITY)
MODULE POWER CONNECTOR
TABS FACE TOP OF MODULE
(WIRES NOT SHOWN FOR CLARITY)

Figure 2 - LM4R Module Power and Data Connectors

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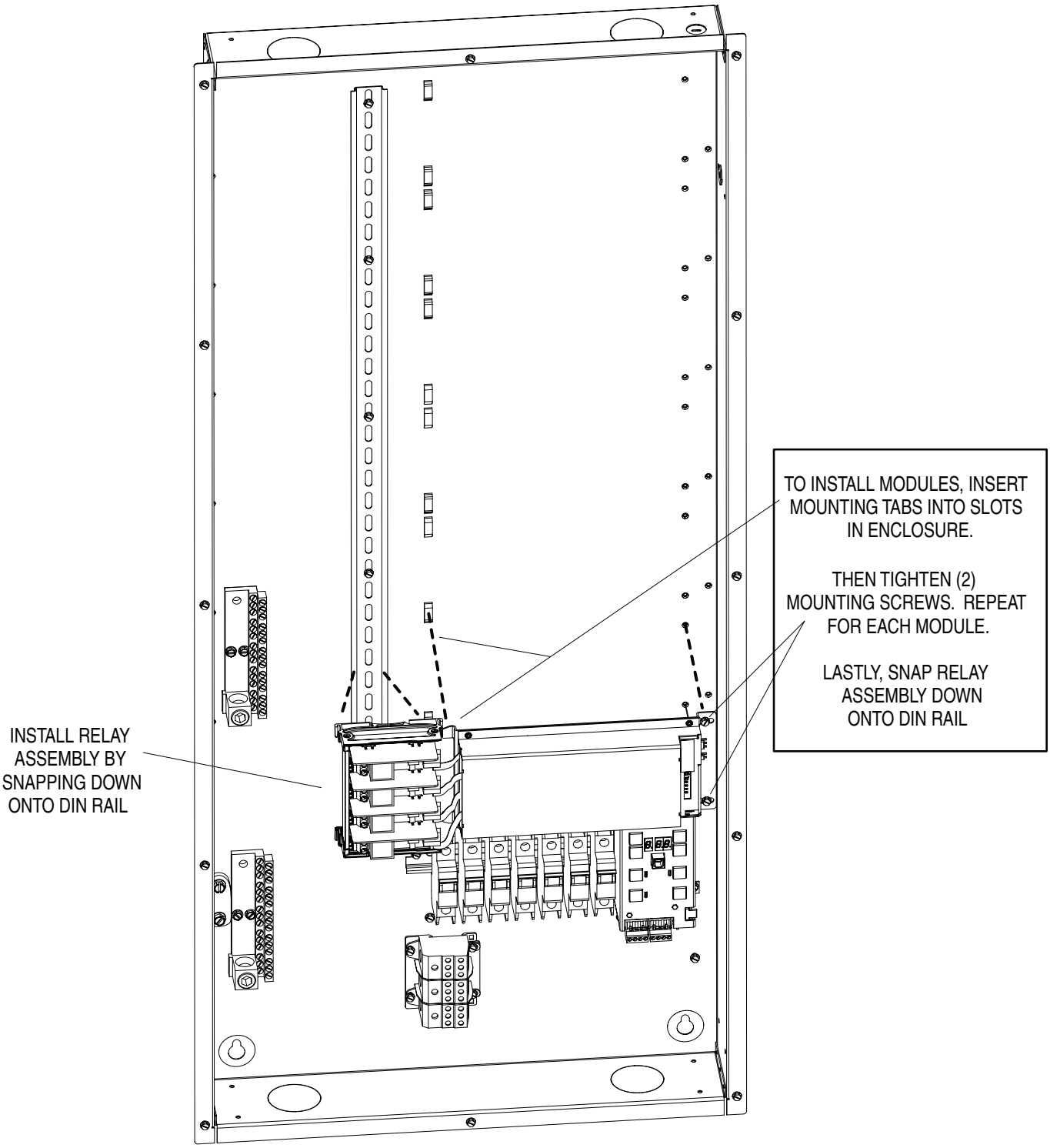
TO INSTALL MODULES, INSERT MOUNTING TABS INTO SLOTS IN ENCLOSURE.
THEN TIGHTEN (2) MOUNTING SCREWS. REPEAT FOR EACH MODULE.
LASTLY, SNAP RELAY ASSEMBLY DOWN ONTO DIN RAIL
INSTALL RELAY ASSEMBLY BY SNAPPING DOWN ONTO DIN RAIL

Figure 3 - LM4R Module Mounting

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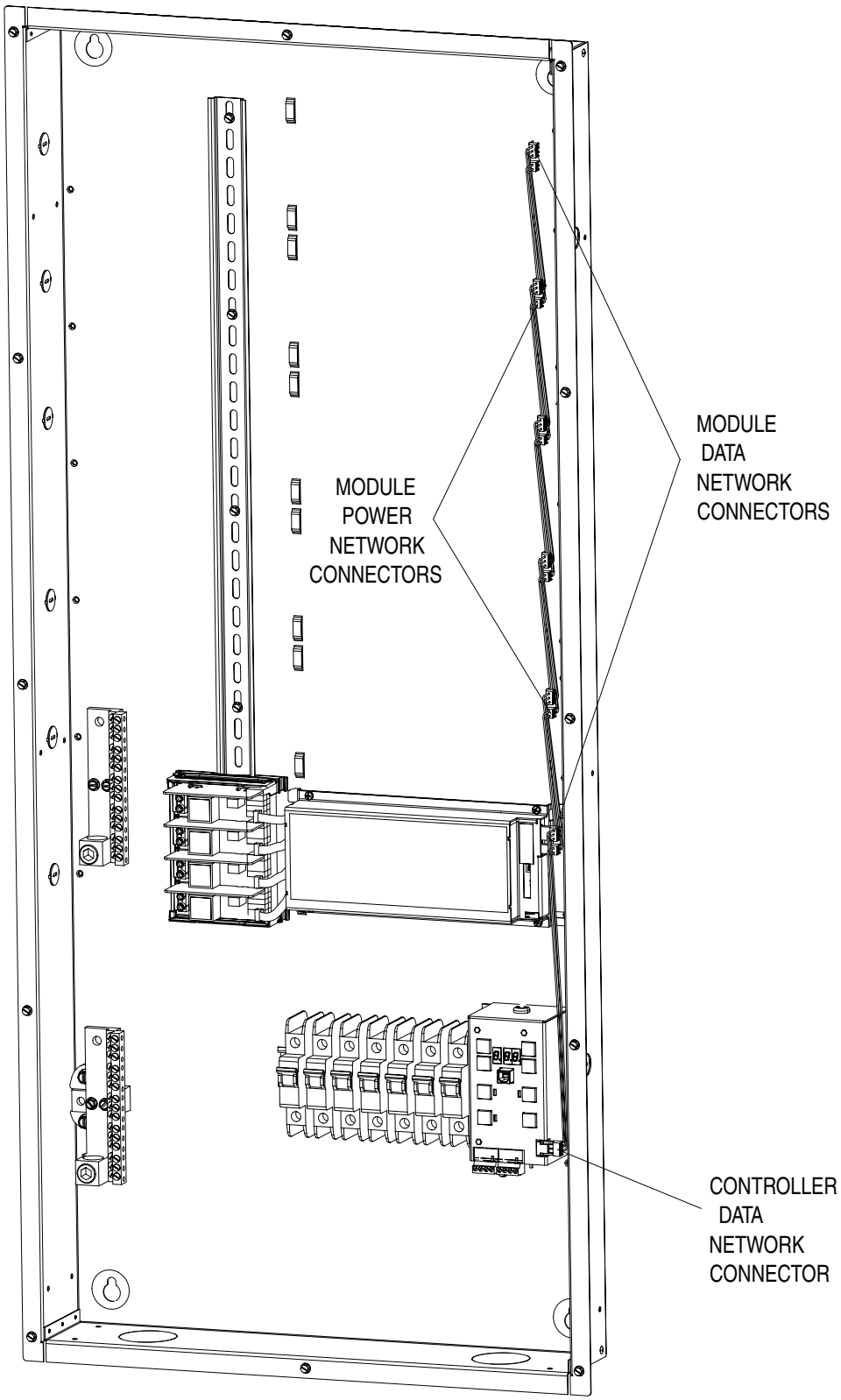

Figure 4 - Module Data and Power Network Connectors

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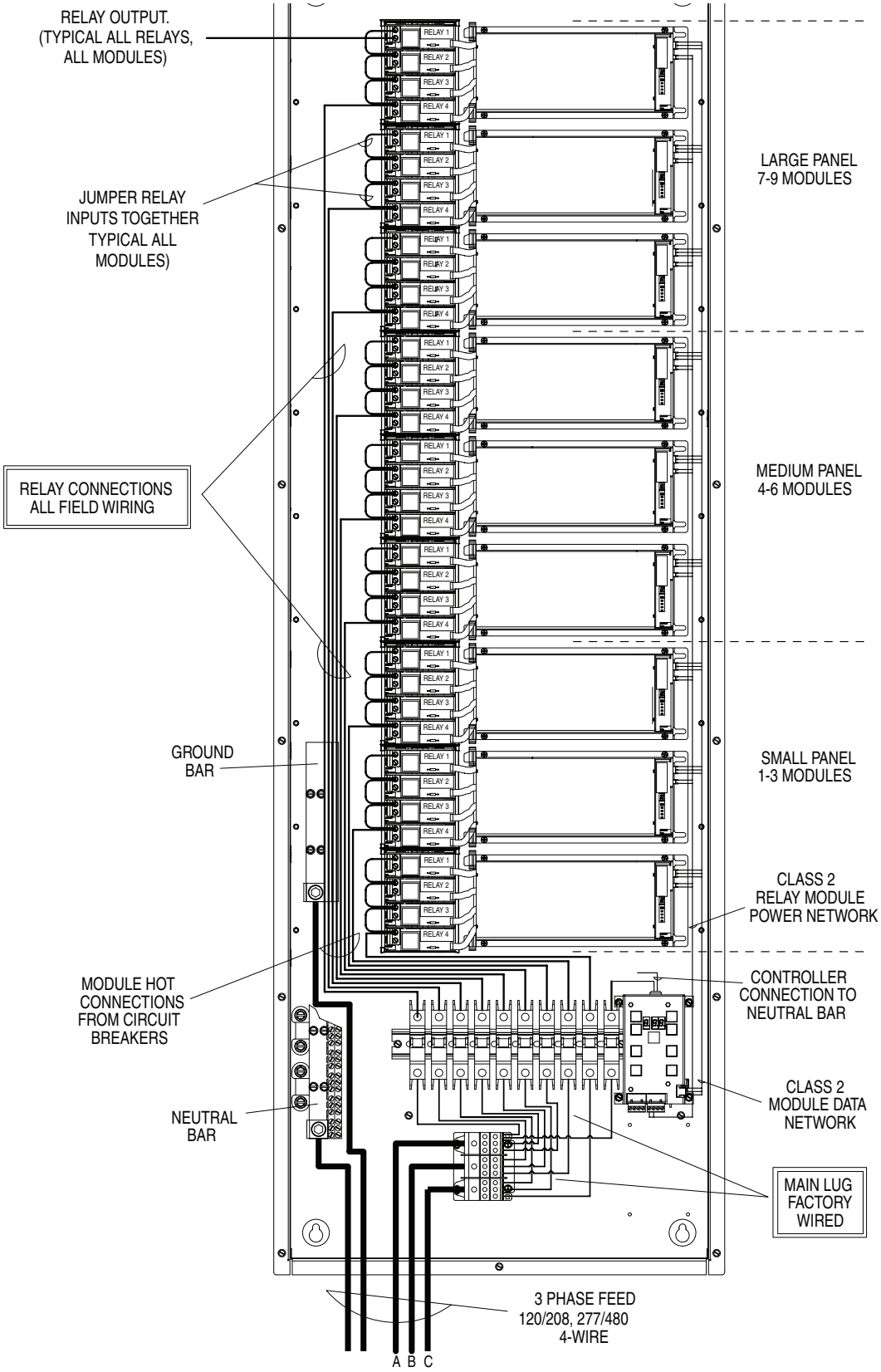

Figure 5 - LM4R MVOLT Relay Wiring Details - Main Lug Panel (LMP Circuit Breakers)

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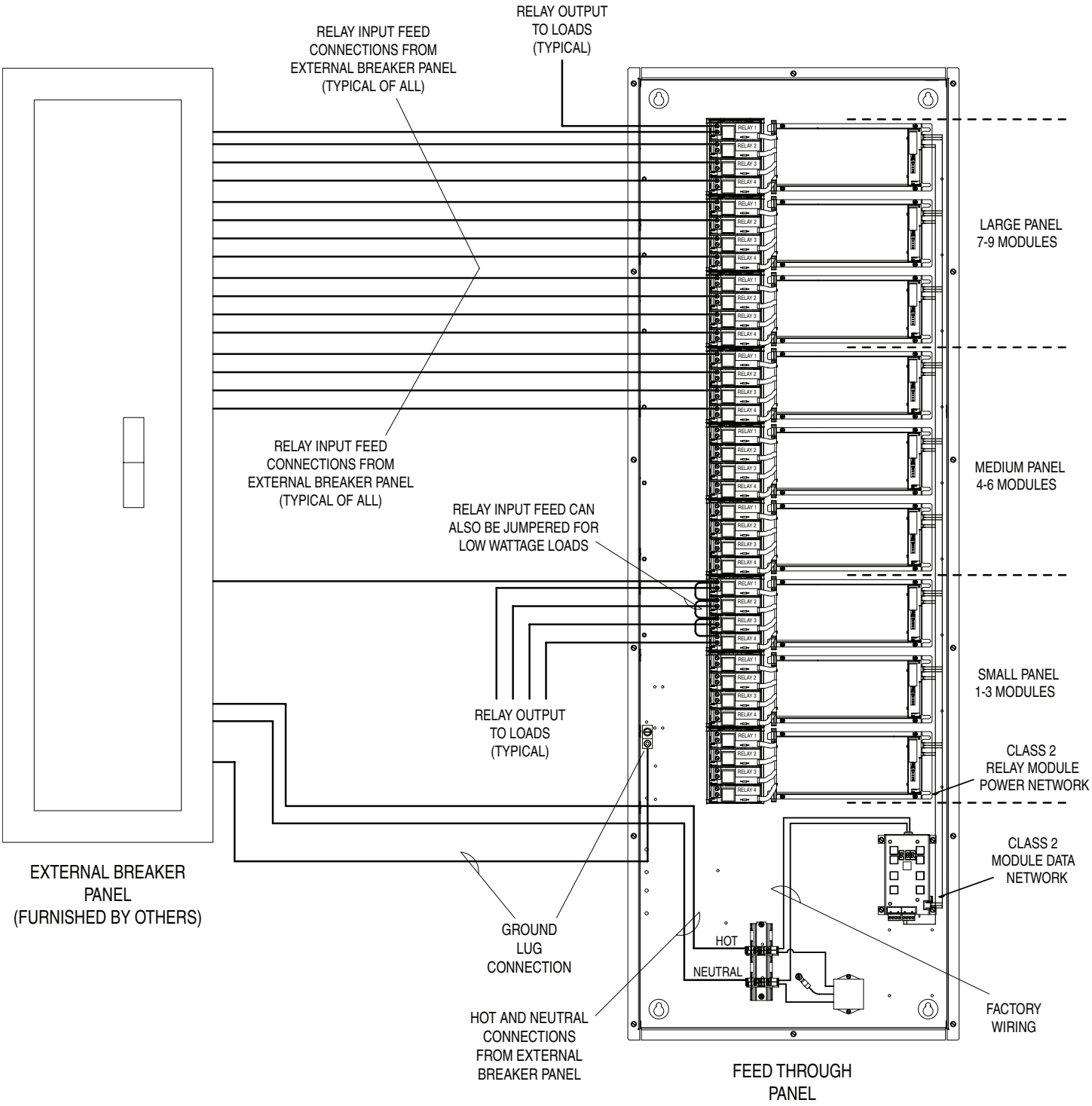
RELAY INPUT FEED CONNECTIONS FROM EXTERNAL BREAKER PANEL (TYPICAL OF ALL)
RELAY OUTPUT TO LOADS (TYPICAL)
LARGE PANEL 7-9 MODULES
MEDIUM PANEL 4-6 MODULES
SMALL PANEL 1-3 MODULES
RELAY INPUT FEED CONNECTIONS FROM EXTERNAL BREAKER PANEL (TYPICAL OF ALL)
RELAY INPUT FEED CAN ALSO BE JUMPERED FOR LOW WATTAGE LOADS
RELAY OUTPUT TO LOADS (TYPICAL)
CLASS 2 RELAY MODULE POWER NETWORK
CLASS 2 MODULE DATA NETWORK
EXTERNAL BREAKER PANEL (FURNISHED BY OTHERS)
GROUND LUG CONNECTION
HOT
NEUTRAL
FACTORY WIRING
HOT AND NEUTRAL CONNECTIONS FROM EXTERNAL BREAKER PANEL
FEED THROUGH PANEL

Figure 6 - LM4R MVOLT Relay Wiring Details -Feed Through Panel (External Breakers)

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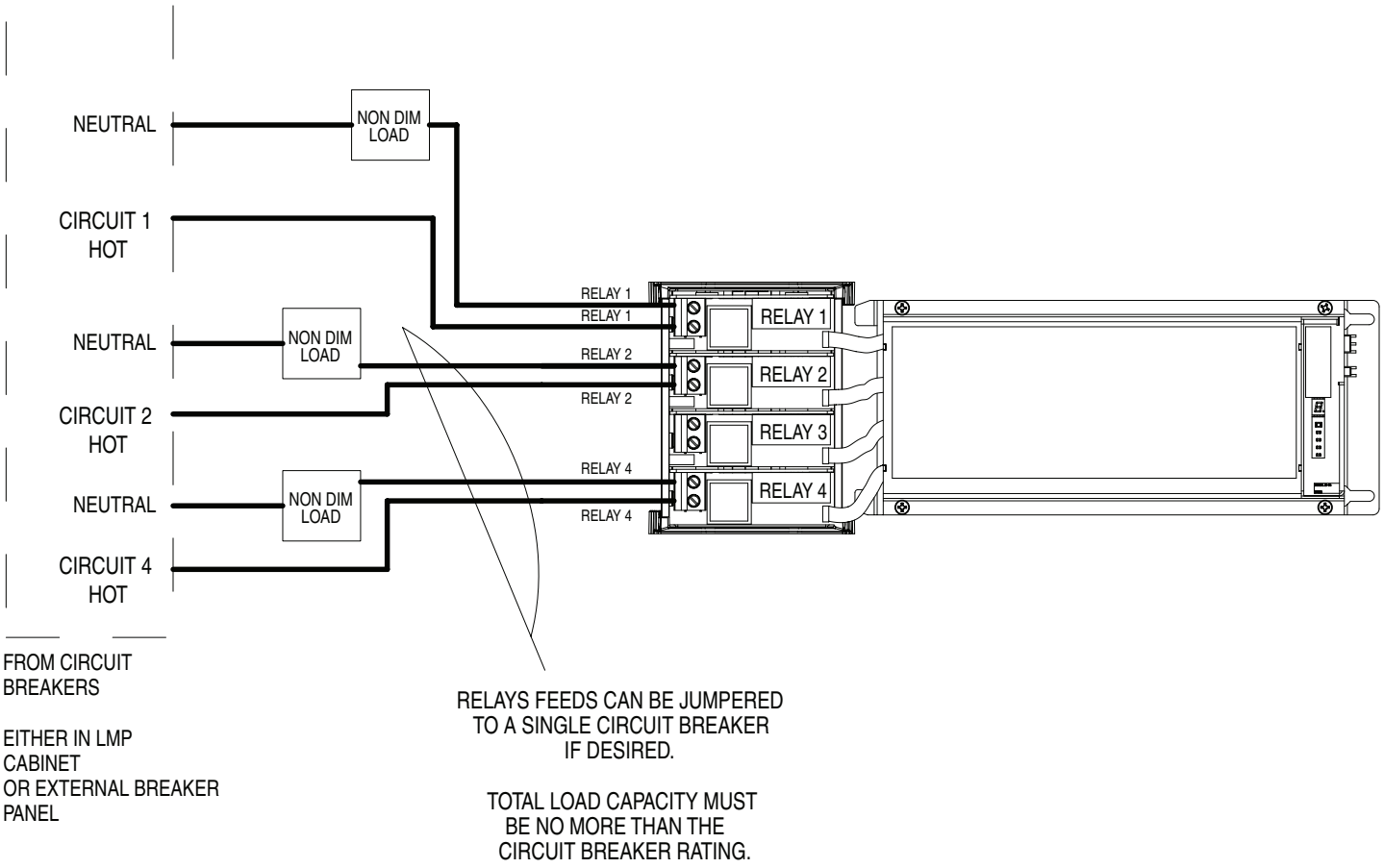

Figure 7 - LM4R MVOLT Load Wiring Details

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Troubleshooting		
7 Segment Display Error Code[1]:	Red Status LED:	Note: See additional note below (2) for troubleshooting tips besides the listed error codes automatically detected by the module.
"E1"	Solid **Red**	**Error: Communication signal missing or distorted** 1. Check the communication wire harness connections and ensure that the plugs are fully inserted into the module and controller connectors. 2. Inspect the communication wires and repair or replace the wire harness if it is damaged. 3. Consult the factory for addition troubleshooting steps if the communication wires and connections appear OK.
"E2"		**Error: Brownout mode, input 24Vdc input voltage is too low** 1. Check the two position Class 2 power wire harness connections and ensure that the plug is fully inserted into the module and wires connected to the LMP Controller STATION NETWORK 24V output connector (red and black wire). 2. Measure the input voltage with the voltmeter on the LMP Controller STATION NETWORK output: it should within 5% of 24Vdc (22.8 to 25.2Vdc). 3. Inspect the LMP Controller to ensure it's ON; check the input circuit breaker (if provided in non-FT panel). 4. Consult the factory for additional troubleshooting steps if the power harness and 24V supply appear OK.
"E3"		**Error: The relay output(s) are overloaded, or output wiring or loads are shorted** 1. Disconnect each output from the relay cards and check for short circuits; correct any that are found before reconnecting the load circuit to the relay card terminal. 2. Measure the load current to verify that no individual relay card output is not overloaded. Correct any overload condition by splitting up circuits which are too large onto multiple switched outputs.
"E4"		**Error: Module electronics failure** 1. Check the ambient temperature around the panel to verify that it is less than 400C. 2. Check if other modules inside the panel are overheating. 3. Consult the factory.

1. Note that "E" is flashing for 0.5s followed by "#" for 0.5 seconds.
2. Check the ribbon cables (from the relay controller to the relay cards) if the relay(s) are not actuating.

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